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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/599,102

09/19/2006

Shin Nakamura

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EXAMINER

TURNER, KATHERINE ANN

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

07/20/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/599,102	Applicant(s) NAKAMURA ET AL.	
	Examiner Katherine Turner	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 7 and 8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 7 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/19/2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 2, 2009 has been entered. Claims 1, 7, and 8 are pending. Claim 1 is amended. Claims 2-6 and 9-13 are cancelled.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on June 12, 2008.

Drawings

3. The objections to the drawings are withdrawn in light of amendment.

Claim Rejections - 35 USC § 103

4. Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ren et al. (US 2004/0209136) in view of Kinkelaar et al. (US 2004/0001991).

As to claim 1, Ren et al. discloses a solid electrolyte fuel cell (having a solid membrane electrolyte) (paragraph 24) comprising:

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- layers of a fuel cell (Applicant's laminate) compressed to adhesion by bolts (122) (figures 1-4 and 8; paragraph 45, lines 17-22) of
- a methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) (figures 2-4 and 8; paragraph 48, lines 24-27; paragraph 31),
- an anode current collector (224, 424, 823) (figures 2-4 and 8; paragraphs 49, 67, and 79),
- a catalyzed membrane electrolyte (204, 404, 804) with an electrocatalyst coating on an anode face (206) (Applicant's anode catalyst layer), a membrane electrolyte (Applicant's solid electrolyte membrane), and an electrocatalyst coating on a cathode face (208) (Applicant's cathode catalyst layer) (figures 2-4 and 8; paragraph 48),
- a cathode current collector (226, 426, 836) (figures 2-4 and 8; paragraphs 49, 67, and 79),
- and a cathode filter (290, 480, 880) (Applicant's evaporation inhibiting layer) which limits cathode water evaporation rate (paragraphs 59 and 85)
- in sequence (figures 2-4 and 8),
- wherein the cathode filter (290, 480, 880) (Applicant's evaporation inhibiting layer) which covers the surface of the cathode current collector (226, 426, 836) (figures 2-4 and 8; paragraphs 85-86).

Ren et al. discloses the cathode filter (Applicant's evaporation inhibiting layer) as an extra cathode backing layer which limits cathode water evaporation rate and curbs evaporative water loss (paragraphs 58, 82, and 85), but is silent as to the cathode filter (Applicant's evaporation inhibiting layer) being made of woven or unwoven fabric containing fibrous cellulose.

Kinkelaar et al. teaches cathode backing layers/capillarity (32) structure made of woven or nonwoven fibers of cellulose (paragraph 16) that retains liquids, maintain effective gas diffusion, without adversely impacting fuel cell performance or adding significant expense (paragraphs 11-12 and 14), these cathode backing layers/capillarity (32) are laminated outside of a foil current collector (36), and the current collector (36) is laminated to the cathode (18) of the PEM (12) (figure 1; paragraphs 107 and 111). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Kinkelaar et al.'s cathode back layers/capillarity structure made of woven or nonwoven fibers of cellulose as Ren et al.'s cathode filter (Applicant's evaporation inhibiting layer), because Kinkelaar et al. teaches that it retains liquids, maintain effective gas diffusion, without adversely impacting fuel cell performance or adding significant expense (paragraphs 11-12 and 14) and because Ren et al. discloses the desire for the cathode filter to curb evaporative water loss (paragraphs 58, 82, and 85), thus retaining water.

Ren et al. modified by Kinkelaar et al. does not specifically disclose the cathode filter (Applicant's evaporation inhibiting layer) having a volume expansion coefficient of 4.5 or less an initiating water migration from the evaporation inhibiting layer to the

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cathode at a temperature of 80C or lower. However, it is the position of the examiner that such properties are inherent, given that both Ren et al. modified by Kinkelaar et al. and the present application utilize the same material of woven or nonwoven fibers of cellulose (instant application page 12, lines 20-26; examples 1 and 2). A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

Regarding claim 7, Ren et al. discloses a fuel reservoir (450, 850) (Applicant's container) reserving a neat methanol (Applicant's liquid fuel) supplied to an anode side is placed adjacently to the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) (figures 2-4 and 8; paragraph 48, lines 22-27; paragraph 68, lines 1-4).

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ren et al. (US 2004/0209136) and Kinkelaar et al. (US 2004/0001991) as applied to claims 1 and 7 above, and further in view of Wilson (US 6,808,838).

Ren et al. discloses the fuel reservoir (450, 850) (Applicant's container) reserving a neat methanol (Applicant's liquid fuel) supplied to an anode side is placed adjacently to the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) (figures 2-4 and 8; paragraph 48, lines 22-27; paragraph 68, lines 1-4). Carbon dioxide (Applicant's a gas generated by a cell reaction) being vented between the anode diffusion layer (210) and the methanol delivery film (209, 460, 860) (Applicant's limited

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fuel-permeating part) by figure 2's arrow (234) (Applicant's gas discharging part which is not adjacent to the fuel-absorbing member for discharging), the carbon dioxide (Applicant's a gas generated by a cell reaction) travels next to the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part). The methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) resists carbon dioxide from flowing back into the fuel chamber, so some of the carbon dioxide flows into (Applicant's in the limited fuel-permeating part) the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part), but is kept from going into the fuel chamber, therefore directing the carbon dioxide back out according to figure 2's arrow (234) (figures 2-4 and 8; paragraph 49, lines 15-18; paragraph 66). A fuel reservoir (450, 850) placed adjacently to the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) (figures 2-4 and 8; paragraph 48, lines 22-27; paragraph 68, lines 1-4). Ren et al. desires to have the liquid methanol in the fuel reservoir (450, 850) to undergo a phase change to methanol vapor prior to introduction to anode (figures 2-4 and 8; paragraph 68).

Ren et al. is silent as to a fuel-absorbing member being placed adjacently to a part of the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) that absorbs the liquid fuel.

Wilson teaches a superabsorbent material (36) (Applicant's fuel-absorbing member) being placed within a fuel reservoir cavity (34) (figure 2B; column 6, lines 12-40). Wilson teaches that the superabsorbent material (36) (Applicant's fuel-absorbing member) supplies phase changed methanol from neat liquid to vapor form, which limits

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methanol cross-over (column 4, lines 57-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Wilson's superabsorbent material (36) (Applicant's fuel-absorbing member) to Ren's fuel reservoir (450, 850), because Wilson teaches that the superabsorbent material (36) (Applicant's fuel-absorbing member) supplies phase changed methanol, from neat liquid to vapor form, which limits methanol cross-over (column 4, lines 57-62), and desired by Ren et al. (figures 2-4 and 8; paragraph 68).

Response to Arguments

6. Applicant's arguments filed June 2, 2009 have been fully considered but they are not persuasive.

7. *Applicant's principal arguments are:*

(a) *Ren's cathode filter is to filter air impurities, and the microporous layer for blocking flow of liquid is disposed inside the cathode current collector.*

(b) *Kinkelaar et al. and Ren are drawn to different devices.*

In response to Applicant's arguments, please consider the following comments.

(a) Ren et al. discloses that the cathode filters (290, 480, 880) limit cathode water evaporation rate and curb evaporative water loss (paragraphs 82 and 85). These cathode filters are located on the outside of the cathode current collector (226, 426, 836) (figures 2, 3, 4, and 8).

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(b) Kinkelaar et al. utilizes cathode backing layers/capillarity (32) structure made of woven or nonwoven fibers of cellulose (paragraph 16) that retains liquids, maintain effective gas diffusion, without adversely impacting fuel cell performance or adding significant expense (paragraphs 11-12 and 14), these cathode backing layers/capillarity (32) are laminated outside of a foil current collector (36), and the current collector (36) is laminated to the cathode (18) of the PEM (12) (figure 1; paragraphs 107 and 111). This is the same location as Ren et al.'s cathode filters (290, 480, 880) and provide the same protection against water loss by retaining liquids. The fact that the water is later recycled does not make the similar function of the layers different.

Correspondence/Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine Turner whose telephone number is (571)270-5314. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571)272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. T./

Examiner, Art Unit 1795

/Dah-Wei D. Yuan/

Supervisory Patent Examiner, Art Unit 1795